



IFW

Attorney Docket: UCONAP/207/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of: Alexandros Makriyannis et al

Application No.: 10/647,544 Examiner: Aulakh, Charanjit

Filing Date: 08/25/2003 Group Art Unit: 1625

For: Keto Cannabinoids With Therapeutic Indications

Commissioner for Patents, U.S. Patent and Trademark Office, 2011 South Clark
Place, Customer Window, Crystal Plaza 2, Lobby, Room 1B03, Arlington, VA 22202

Sir:

Information Disclosure Statement

Applicant submits herewith patents, publications or other information of which they are aware and which they believe may be material to the examination of the above-identified application and in respect of which there may be a duty to disclose in accordance with 37 CFR 1.56.

This Information Disclosure Statement is not intended to constitute an admission that any patent, publication or other information referred to herein or submitted herewith is "prior art" for this invention unless specifically designated as such.

In accordance with 37 CFR 1.97(g) and (h), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(b) exists.

For US national applications filed after June 30, 2003 and International applications that have entered the national stage after June 30, 2003 a copy of a cited US patent or cited US patent publication is NOT required. See OG Notices: 5 August 2003. Accordingly, no copies of a cited US patent or cited US patent publication are enclosed for

these applications. A copy of each item other than a US patent or a US patent publication listed on the attached INFORMATION DISCLOSURE CITATION IN AN APPLICATION is supplied herewith.

For US national applications filed before June 30, 2003 and International applications that have entered the national stage before June 30, 2003 a copy of each of the items listed on the attached INFORMATION DISCLOSURE CITATION IN AN APPLICATION is supplied herewith.

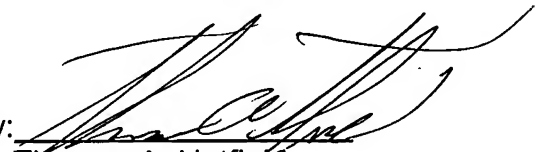
Citations in bold type and having a name preceded with *1* indicate references which are believed to be more closely related to the claimed subject matter. This indication is not meant to indicate or imply any position with respect to the remaining references.

Citations in italics and having a name preceded with *** indicate references for which Applicant has no copy to submit. If a copy of any of these references is procured the same will be filed in a subsequent IDS.

Respectfully submitted,

Alexandros Makriyannis et al

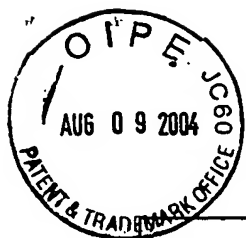
By:



Thomas A. Hatfield
Registration No. 47,637
Alix, Yale & Ristas, LLP
Attorney for Applicants

Date: 8/4/2004
750 Main Street- Suite 1400
Hartford, CT 06103-2721
(860) 527-9211

G:\AYR saved docs\Filing Docs\Uconap\uconap207us regular of uconap.200.us\8-04 IDS.doc



INFORMATION DISCLOSURE CITATION IN AN APPLICATION		Application No. 10/647,544		Inventor Alexandros Makriyannis et al	
		Title Keto Cannabinoids With Therapeutic Indications			
		Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US	
Mailed on: August 4, 2004					
UNITED STATES PATENT DOCUMENTS					
Examiner Initial	Document No.	Date	Name		Class
	09/600786	11/24/99	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 00/32200 enclosed herewith)		
	09/701989	6/9/99	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 99/64389 enclosed herewith)		
	10/110865	10/18/00	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 01/28497 enclosed herewith)		
	10/110830	10/18/00	*1* Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 01/28329 enclosed herewith)		
	10/110812	10/18/00	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 01/28498 enclosed herewith)		
	10/110862	10/18/00	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 01/29007 enclosed herewith)		
	10/111059	10/18/00	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 01/28557 enclosed herewith)		
	10/483482	7/11/02	*1* Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 03/005960 enclosed herewith)		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION			Application No. 10/647,544		Inventor Alexandros Makriyannis et al	
			Title Keto Cannabinoids With Therapeutic Indications			
			Filing Date 08/25/2003		Group Art Unit 1625	
Mailed on: August 4, 2004						
	10/493093	10/28/02	Makriyannis et al (copy not included, this is the U.S. National Phase of the Int'l Application published as WO 03/35005 enclosed herewith)			
	10/790498	3/1/04	Makriyannis et al			
	2002/0119972	8/29/02	Leftheris et al			
	2003/0120094	6/26/03	*1* Makriyannis et al			
	2003/0149082	8/7/03	Makriyannis et al			
	2004/0077649	4/22/04	Makriyannis et al			
	2004/0077851	4/22/04	Makriyannis et al			
	2004/0087590	5/6/04	Makriyannis et al			
	3041343	6/26/62	Jucker et al			
	3465024	9/2/69	Brownstein et al			
	3573327	3/30/71	*1* Miyano			
	3577458	5/4/71	Brownstein et al			
	3886184	5/27/75	*1* Matsumoto et al			
	3897306	7/29/75	*1* Vidic			
	3915996	10/28/75	*1* Wright			
	3928598	12/23/75	Archer			
	3944673	3/16/76	Archer			
	3953603	4/27/76	Archer			
	4036857	7/19/77	*1* Razdan et al			
	4054582	10/18/77	Blanchard et al			
	4087545	5/2/78	Archer et al			
	4087546	5/2/78	Archer et al			
	4087547	5/2/78	Archer et al			
	4088777	5/9/78	Archer et al			
	4102902	7/25/78	Archer et al			
	4152450	5/1/79	Day et al			
	4171315	10/16/79	Ryan et al			
	4176233	11/27/79	*1* Archer et al			
	4179517	12/18/79	*1* Mechoulam			
	4188495	2/12/80	Althuis et al			
	4208351	6/17/80	Archer et al			
	4278603	7/14/81	Thakkar et al			
	4282248	8/4/81	Mechoulam et al			
	4395560	7/26/83	Ryan			

INFORMATION DISCLOSURE CITATION IN AN APPLICATION			Application No. 10/647,544		Inventor Alexandros Makriyannis et al	
			Title Keto Cannabinoids With Therapeutic Indications			
			Filing Date 08/25/2003		Group Art Unit 1625	
Mailed on: August 4, 2004						
	4497827	2/5/85	Nelson			
	4550214	10/29/85	Mehta			
	4758597	7/19/88	Martin et al			
	4812457	3/14/89	Narumiya			
	4876276	10/24/89	*1* Mechoulam			
	4885295	12/5/89	Bell et al			
	5053548	10/1/91	Tanaka et al			
	5068234	11/26/91	D'Ambra et al			
	5147876	9/15/92	Mizuchi et al			
	5223510	6/29/93	Gubin et al			
	5284867	2/8/94	*1* Kloog			
	5324737	6/28/94	D'Ambra et al			
	5434295	7/18/95	Mechoulam et al			
	5440052	8/8/95	*1* Makriyannis et al			
	5462960	10/31/95	Barth et al			
	5489580	2/6/96	Makriyannis et al			
	5521215	5/28/96	Mechoulam			
	5532237	7/2/96	Gallant et al			
	5538993	7/23/96	*1* Mechoulam			
	5605906	2/25/97	Lau			
	5607933	3/4/97	D'Ambra et al			
	5618955	4/8/97	Mechoulam et al			
	5624941	4/29/97	*1* Barth et al			
	5635530	6/3/97	Mechoulam			
	5688825	11/18/97	Makriyannis et al			
	5747524	5/5/98	Cullinan et al			
	5744459		Makriyannis et al			
	5804601	9/8/98	Kato et al (appears equivalent to EP0737671)			
	5817651	10/6/98	D'Ambra et al			
	5872148	2/16/99	*1* Makriyannis et al			
	5874459	2/23/99	Makriyannis et al			
	5925628	7/20/99	Lee et al			
	5925768	7/20/99	Barth et al			
	5932610	8/3/99	*1* Shohami et al			
	5948777	9/7/99	Bender et al			

INFORMATION DISCLOSURE CITATION IN AN APPLICATION			Application No. 10/647,544		Inventor Alexandros Makriyannis et al	
			Title Keto Cannabinoids With Therapeutic Indications			
			Filing Date 08/25/2003		Group Art Unit 1625	
Mailed on: August 4, 2004						
	6013648	1/11/00	*1* Rinaldi et al (appears equivalent to FR2735774)			
	6028084	2/22/00	Barth et al			
	6096740	9/1/00	Mechoulam			
	6127399	10/3/00	Yuan			
	6166066	12/26/00	*1* Makriyannis et al			
	6284788	10/4/01	Mittendorf et al (appears equivalent to EP860168)			
	6391909	5/21/02	Makriyannis et al			
	6579900	6/17/03	Makriyannis et al			
	6610737	8/26/03	Garzon et al			
FOREIGN PATENT DOCUMENTS						
Examiner Initial	Document No.	Date	Country	Name		Translation
	EP0276732	8/3/88	EP	*1* Hoffman La Roche		
	EP0471609	6/29/93	EP	Gubin et al, in French, front page only (English bibliography and abstract, appears equivalent to US5223510)		
	EP0737671	10/16/96	EP	Takeda Chemical Industries, front page only (bibliography, appears equivalent to US 5804601)		
	EP0860168	9/4/01	EP	Mittendorf et al, in German, front page only (including English bibliography, appears equivalent to US6284788)		
	FR2240003	5/27/75	FR	*1* Matsumoto et al, in French (including English bibliography and abstract, appears equivalent to US3886184)		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION			Application No. 10/647,544		Inventor Alexandros Makriyannis et al	
			Title Keto Cannabinoids With Therapeutic Indications			
			Filing Date 08/25/2003		Group Art Unit 1625	
Mailed on: August 4, 2004						
	FR2735774	1/11/00	FR	*1* Barth et al, in French (including English bibliography and abstract, appears equivalent to US6013648)		
	GB2027021A	2/13/80	GB	Mechoulam et al, in English (appears equivalent to US4282248)		
	JP57098228	6/18/82	JP	Noda et al, in Japanese (including English bibliography and abstract)		
	WO 00/32200	6/8/00		Makriyannis et al, in English		
	WO 01/28329	4/26/01		*1* Makriyannis et al, in English		
	WO 01/28497	4/26/01		Makriyannis et al, in English		
	WO 01/28498	4/26/01		Makriyannis et al, in English		
	WO 01/28557	4/26/01		Makriyannis et al, in English		
	WO 01/29007	4/26/01		Makriyannis et al, in English		
	WO 01/32169	5/10/01		Fride et al, in English		
	WO 01/58869	8/16/01		Pandit et al, in English, first page only (including bibliography and abstract, appears equivalent to US2002/0119972)		
	WO 03/005960	1/23/03		*1* Makriyannis et al, in English		
	WO 03/020217	3/13/03		Makriyannis et al , in English		
	WO 03/035005	5/1/03		Makriyannis et al, in English		
	WO 03/063758	8/7/03		Garzon et al, in English		
	WO 03/064359	8/7/03		Garzon et al, in English		
	WO 97/00860	1/9/97		Rinaldi et al, in French (including English bibliography and abstract, appears equivalent to US6013648)		
	WO 99/57107	11/11/99		*1* Makriyannis et al, in English		
	WO 99/64389	12/16/99		Makriyannis et al, in English		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION		Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
		Title Keto Cannabinoids With Therapeutic Indications		
		Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004				
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)				
Examiner Initial				
	Abadji V., Lin S., Taha G., Griffin G., Stevenson L.A., Pertwee R.G., Makriyannis A.; "(R)-Methanadamide: a chiral novel anandamide possessing higher potency and metabolic stability"; J. Med. Chem.; 37(12); 1889-1893; 1994; CODEN: JMCMAR; ISSN: 0022-2623; XP002040932			
	1 Alo, B.I.; Kandil, A.; Patil, P. A.; Sharp, M. J.; Siddiqui, M. A.; and Snieckus, V. Sequential Directed Ortho Metalation-Boronic Acid Cross-Coupling Reactions. A general Regiospecific Route to Oxygenated Dibenzo[b,d]pyran-6-ones Related to Ellagic Acid, J. Org. Chem. 1991, 56, 3763-3768			
	*** Archer et al; "cannabinoids, synthesis approaches to 9-ketocannabinoids."; J. Org. Chem.; vol. 42; no. 13; 2277-2284; (1977)			
	1 Arnone M., Maruani J., Chaperon P, et al, Selective inhibition of sucrose and ethanol intake by SR141716, an antagonist of central cannabinoid (CB1) receptors, Psychopharmacol, (1997) 132, 104-106. (abstract only)			
	1 Barnett-Norris et al; "Exploration of biologically relevant conformations of anandamide, . . ."; J. Med. Chem.; vol. 41; 4861-4872; 1998			
	1 Beak, P.; and Brown, R A., The Tertiary Amide as an Effective Director of Ortho Lithiation, J. Org. Chem. 1982, 47, 34-36			
	1 Belgaonkar et al; "synthesis of isocoumarins"; Indian J. Chem; vol. 13; no. 4; 336-338; 1975 (abstract only)			
	Beltramo M., Stella N., Calignano A., Lin S. Y., Makriyannis A., Piomelli D; "Functional Role Of High-Affinity Anandamide Transport, as Revealed By Selective Inhibition"; Science; vol. 277; 1094-1097; 1997			
	Beltramo M., Stella N., Calignano A., Lin S. Y., Makriyannis A., Piomelli D; "Identification and Functional Role of High Affinity Anandamide Transport"; The Neurosciences Institute (1 page)			
	Berdyshev EV, Cannabinoid receptors and the regulation of immune response. Chem Phys Lipids. 2000 Nov; 108(1-2):169-90			

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	Berglund et al; "Structural requirements for arachidonylethanolamide interaction with CB1 and CB2 cannabinoid receptors: . . ."; Prostaglandins, leukotrienes and essential fatty acids; 59(2); 111-118; (1998). (abstract only)		
	Bodnar, V.N., Lozinskii, M.O., Pel'kis, P.S.; "Synthesis fo 2,5-disubstituted 1,3,4-oxadiazoles and 1,4-dihydro-1,2,4,5-tetrazines"; Ukrainskii Khimicheskii Zhurnal (Russian Edition); 48(12); 1308-1311; 1982 (abstract only)		
	Bracey, M et al, Structural Adaptations in a Membrane Enzyme That Terminates Endocannabinoid Signaling. Science 2002; 298(5599): 1793-1796		
	1 Brenneisen R, Pgli A, Elsohly MA, Henn V. Spiess Y: The effect of orally and rectally administered 9 – tetrahydrocannabinol on spasticity, a pilot study with 2 patients. Int. J. Clin Pharmacol Ther. (1996) 34:446-452. (abstract only)		
	1 *** Brotchie JM: Adjuncts to dopamine replacement a pragmatic approach to reducing the problem of dyskinesia in Parkinson's disease. Mov. Disord. (1998)13:871-876.		
	1 Brown et al; "Synthesis and hydroboration of (-)-2-phenylapopinene, Comparison of mono(2-phenylapoisopinocampheyl)borane with its 2-methyl and 2-ethyl analogues for the chiral hydroboration of representative alkenes"; J. Org. Chem.; 55(4); 1217-1223; (1990)		
	1 Buckley NE, McCoy KI, Mpzey E et al, "Immunomodulation by cannabinoids is absent in mice deficient for the cannabinoid CB2 receptor"; Eur. J Pharmacol (2000) 396:141-149.		
	1 Burstein et al; "detection of cannabinoid receptors . . ."; Biochem. Biophys. Res. Commun.; vol. 176(1); 492-497; 1991 (abstract only)		
	Busch-Peterson et al; "Unsaturated side chain beta-11-hydroxyhexahydrocannabinol analogs"; J. Med. Chem.; 39; 3790-3796; (1996)		
	1 Calignano A, La Rana G. Diuffrida A, Piomelli D; "Control of pain initiation by endogenous cannabinoids"; Nature (1998) 394:277-291. (abstract only)		
	Calignano A., La Rana G., Beltramo, M., Makriyannis A., Piomelli D; "Potentiation of Anandamide Hypotension by the Transport Zinhibitor, AM404"; Eur. J. Pharmacol.; 1997; 337 R1-R2		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	Calignano A., La Rana G., Makriyannis A., Lin. S., Beltramo M., Piomelli D; "Inhibition of Intestinal Motility by Anandamide, an Endogenous Cannabinoid"; Eur. J. Pharmacol.; 1997; 340 R7-R8		
	Campbell FA et al; "Are cannabinoids an effective and safe treatment option in the management of pain? A qualitative systematic review"; BMJ. 2001 Jul 7;323(7303):13-6		
	1 Charalambous A. et al; "5'-azido 8-THC: A Novel Photoaffinity Label for the Cannabinoid Receptor"; J. Med. Chem., 35, 3076 - 3079 (1992)		
	1 Charalambous A. et al; "Pharmacological evaluation of halogenated . . ."; Pharmacol. Biochem. Behav.; vol. 40; no. 3; 509-512; 1991		
	1 Cheng et al; "Relationship Between the Inhibition Constant (Ki) and the concentration of Inhibitor which causes 50% Inhibition (IC50) of an Enzymatic Reaction"; Biochem. Pharmacol., 22, 3099-3102, (1973) (abstract only)		
	Cherest M., Luscindi X.; "The action of acetyl chloride and of acetic anhydride on the lithium nitronate salt of 2-phenylnitroethane . . ."; Tetrahedron; 42(14); 3825-3840; 1986; in French with English abstract		
	Cherest M., Lusinchi X.; "A novel electrophilic N-amidation via electron deficient complexes: action of ferric chloride on N-acetyloxyamides"; Tetrahedron Letters; 30(6); 715-718; 1989		
	1 Colombo G, Agabio R, Diaz G. et al; "Appetite suppression and weight loss after the cannabinoid antagonist SR141716"; Life Sci. (1998) 63-PL13-PL117. (abstract only)		
	*** Compton D.R. et al; J. Pharmacol. Exp. Ther.; 260; 201-209; 1992		
	1 Compton et al; "Synthesis and pharmacological evaluation of ether and related analogues of delta8-. delta9- and delta9,11- tetrahydrocannabinol"; J. Med. Chem; vol. 34; no. 11; 3310-3316; 1991		
	1 Consroe P, Musty R, Rein J, Tillery W, Pertwee R; "The perceived effects of smoked cannabis on patents with multiple sclerosis"; Eur. Neurol. (1997) 38-44-48. (abstract only)		
	Coxon et al; "Derivatives of nopinone"; Aust. J. Chem.; 23; 1069-1071; (1970) (abstract only)		
	1 Crawley et al; "Anandamide, an endogenous ligand of the cannabinoid receptor, induces hypomotility and hypothermia in vivo in rodents"; Pharmacology Biochemistry and Behavior; vol. 46; 967-972; 1993		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	D'Ambra et al; "C-attached aminoalkylindoles: potent cannabinoid mimetics"; Bioorg. & Med. Chem. Lett., 1996, 6(1), 17-22		
	*** D'Amour F.E., Smith D.L.; J. Pharmacol. Exp. Ther.; 72; 74-79; 1941		
	Demuynck L. et al; "Rearrangement of Indolo[2,3-a]quinolizidines to derivatives with E-azaaspidospermane skeleton"; Tetrahedron Letters; 30(6) 710-722; 1989; in French with English abstract		
	1 DePetrocellis L, Melck D, Palmisano A. et al; "The endogenous cannabinoid anandamide inhibits human breast cancer cell proliferation"; Proc. Natl. Acad. Sci. USA (July 1998) 95:8375-8380.		
	Desarnaud F., Cadas H., Piomelli D.; "Anandamide amidohydrolase activity in rat brain microsomes"; J. Biol. Chem.; 270; 6030-6035; (1995)		
	Deutsch D.G. et al; "Fatty acid sulfonyl fluorides inhibit anandamide metabolism and bind to cannabinoid receptor"; Biochem. Biophys. Res. Commun. 231(1); 217-221; 1997; CODEN: BBRC9; ISSN:0006-291X; XP002040933		
	Deutsch D.G., Chin S.A.; "Enzymatic synthesis and degradation of anandamide, a cannabinoid receptor agonist"; Biochemical Pharmacology; 46(5); 791-796; 1993		
	1 Devane, W.A. et al; "Determination and Characterization of a Cannabinoid Receptor in a Rat Brain"; Mol. Pharmacol., 34, 605 - 613 (1988). (abstract only)		
	1 Di Marzo, V., Melck, D., Bisogno, T., DePetrocellis, L.; "Endocannabinoids: endogenous cannabinoid receptor ligands with neuromodulatory action"; Trends Neurosci. (1998) 21:521 - 528.		
	*** Dodd, P.R. et al, A Rapid Method for Preparing Synaptosomes: Comparison with Alternative Procedures, Brain Res., 226, 107 - 118 (1981).		
	1 Dominiemi et al; "Synthesis of 5-(tert-Alkyl)resorcinols"; J. Org. Chem. 42(2); 344-346; (1977)		
	Drake et al, "classical/nonclassical hybrid cannabinoids"; J. Med. Chem.; vol. 41(19); 3596-3608 (1998)		
	Edery et al; "Activity of novel aminocannabinoids in baboons"; J. Med. Chem.; 27; 1370-1373 (1984)		
	Eissenstat et al; "Aminoalkylindoles: structure-activity relationships of novel cannabinoid mimetics"; J. Med. Chem. 1995, Vol. 38, No. 16, pp. 3094-3105; XP 000651090		
	Fahrenholtz, K. E., Lurie, M. and Kierstead, AR. W.; "The Total Synthesis of dl- Δ^9 -Tetrahydrocannabinol and Four of Its Isomers"; J. Amer. Chem. Soc. 1967, 89(23), 5934-5941		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	1 Fahrenholtz; "The synthesis of 2 metabolites of (-)-delta eight-tetrahydrocannabinol"; J. Org. Chem.; vol. 37(13); 1972; XP002111824		
	Fisera, L., Kovac, J., Lesco, J., Smahovsky, V.; "Furan derivatives. Part CLVI. 1,3-dipolar cycloadditions of heterocycles. V. Reaction of C-acetyl-N-phenylnitrilimine with furan derivatives"; Chemicke Zvesti; 35(1); 93-104 1981 (abstract only)		
	1 Fride, E. & Mechoulam, R.; "Pharmacological activity of the cannabinoid receptor agonist, anandamide, a brain constituent"; European Journal of Pharmacology, vol. 231; 313-314; 1993.		
	Galiegue S et al. ; "Expression of central and peripheral cannabinoid receptors in human immune tissues and leukocyte subpopulations"; Eur J Biochem.; 1995 Aug 15;232(1):54-61. (abstract only)		
	1 Gareau, Y.; Dufresne, C.; Gallant, M.; Rochette, C.; Sawyer, N.; Slipetz, D. M.; Tremblay, N.; Weech, P. K.; Metters, K. M.; Labelle, M.; "Structure activity relationships of tetrahydrocannabinol analogs on human cannabinoid receptors"; Bioorg. Med. Chem. Lett. 1996, 6(2), 189-194		
	1 Gold et al; "A comparison of the discriminative stimulus properties of delta9-tetrahydrocannabinol and CP 55,940 in rats and rhesus monkeys"; J. Pharmacol. Exp. Ther.; vol. 262(2); 479-486; 1992		
	1 *** Green K. Marijuana smoking vs. cannabinoids for glaucoma therapy. Arch. Ophthalmol. (1998) feb 433-1437.		
	1 Hampson, A.J., Grimaldi M. Axpirod J. Wink D; "Cannabidiol and (-)-9 tetrahydrocannabinol are neuroprotective antioxidants"; Proc. Natl Acad Sci. USA (July 1998) 95; 8268-8273.		
	1 Hargreaves, K. et al; "A new sensitive method for measuring thermal nociception in cutaneous hyperalgesia"; Pain; 32; 77-88; (1988) (abstract only)		
	1 *** Hemming M, Yellowlees PM; "Effective treatment of Tourette's syndrome with marijuana"; J. Psychopharmacol, (1993) 7:389-391.		
	1 Herzberg U, Eliav E, Bennett GJ, Kopin IJ; "The analgesic effects of R(+) WIN 55,212-2 mesylate, a high affinity cannabinoid agonist in a rat model of neuropathic pain"; Neurosci. Letts. (1997) 221; 157-160.		
	Hillard C. J., Edgemond, W. S., Jarrahan W., Campbell, W. B; "Accumulation of N-Arachidonoyl ethanolamine (Anandamide) into Cerebellar Granule Cells Occurs via Facilitated Diffusion"; Journal of Neurochemistry; 69; 631-638 (1997)		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	Horrevoets A.J.G et al; "Inactivation of escherichia coli outer membrane phospholipase A by the affinity label hexadecanesulfonyl fluoride"; Eur. J. Biochem.; 198; 247-253; 1991		
	Horrevoets A.J.G et al; "Inactivation of reconstituted escherichia coli outer membrane phospholipase A by membrane-perturbing peptides results in an increased reactivity towards the affinity label hexadecanesulfonyl fluoride"; Eur. J. Biochem.; 198; 255-261; 1991		
	Howlett et al; "Azido and isothicyanato substituted aryl pyrazoles bind covalently to the CB1 cannabinoid receptor and impair signal transduction"; Journal of Neurochemistry; vol. 74(5) (2000) 2174-2181; XP001097394		
	1 Howlett et al; "Stereochemical effects of 11-OH-delta 8 tetrahydrocannabinol-dimethylheptyl to inhibit adenylate cyclase and bind to the cannabinoid receptor"; Neuropharmacology; vol. 29(2); 161-165; 1990		
	Huffman et al; "3-(1',1'-dimethylbutyl)--deoxy-delta 8THC and related compounds: synthesis of selective ligands for the CB2 receptor"; Bioorganic and Medicinal Chemistry; vol. 7; 2905-2914; (1999)		
	Huffman et al; "Stereoselective synthesis of the epimeric delta 7-tetrahydocannabinols"; tetrahedron; vol. 51(4); 1017-1032; (1995)		
	1 Huffman et al; "Synthesis of 5',11 dihydroxy delta 8 tetrahydrocannabinol"; Tetrahedron, vol. 53(39), pp 13295-13306 (1997)		
	1 Huffman et al; "Synthesis of a tetracyclic, conformationally constrained analogue of delta8-THC"; Bioorganic & Medicinal Chemistry; vol. 6(12); 2281-2288; 1998; XP002123230		
	1 Huffman et al; "Synthesis of both enantiomers of Nabilone from a common intermediate. Enantiodivergent synthesis of cannabinoids"; J. Org. Chem.; 1991, 56, 2081-2086		
	1 *** Joy JE, Wagtson SJ, Benson JA; "Marijuana and Medicine Assessing the Science Base"; National Academy Press, Washington, DC, USA (1999).		
	Kaminski NE; "Regulation of the cAMP cascade, gene expression and immune function by cannabinoid receptors"; J Neuroimmunol. 1998 Mar 15;83(1-2):124-32		
	Kawase M. et al; "Electrophilic aromatic substitution with N-methoxy-N-acylnitrenium ions generated from N-chloro-N-methoxyamides: synthesis of nitrogen heterocyclic compounds bearing a N-methoxyamide group"; J. Org. Chem.; 54; 3394-3403; 1989		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	Khanolkar A., Abadji V., Lin S., Hill W., Taha G., Abouzid K., Meng Z., Fan P., Makriyannis A.; "Head group analogues of arachidonylethanolamide, the endogenous cannabinoid ligand"; J. Med. Chem.; vol. 39(22); 4515-4519; (1996)		
	Khanolkar et al; "Molecular probes for the cannabinoid receptors"; Chemistry and Physics of Lipids; 108; 37-52; (2000)		
	Klein T.W. et al, "The cannabinoid system and cytokine network"; Proc Soc Exp Biol Med. 2000 Oct; 225(1):1-8; (abstract only)		
	Klein TW et al, "Cannabinoid receptors and immunity"; Immunol Today; 1998 Aug; 19(8):373-81		
	Koutek B. et al; "Inhibitors of arachidonyl ethanolamide hydrolysis"; J. Biol. Chem.; 269(37); 22937-40; 1994; CODEN: JBCHA3; ISSN: 0021-9258; XP002040931		
	Kumar RN, et al; "Pharmacological actions and therapeutic uses of cannabis and cannabinoids"; Anesthesia, 2001, 56: 1059-1068 (abstract only)		
	Lan, R et al; "Structure activity relationships of pyrazole derivatives as cannabinoid receptor antagonists"; J. Med. Chem.; vol. 42(4); 769-776; (1999)		
	1 Lavalley et al; "Efficient conversion of (1R, 5R)-(+)-alpha-pinene to (1S, 5R)-(-)-nopinene"; J. Org. Chem.; vol. 51(8); 1362-1365; (1986)		
	Lin S., Khanolkar A., Fan P., Goutopolous A., Qin C., Papahadjis D., Makriyannis A.; "Novel Analogues of arachidonylethanolamide (anandamide): affinities for the CB1 and CB2 Cannabinoid Receptors and Metabolic Stability"; J. Med. Chem.; vol. 41; 5353; 1998		
	1 Loev, B., Bender, P. E., Dowalo, F., Macko, E., and Fowler, P.; "Cannabinoids. Structure-Activity Studies Related to 1,2-Dimethylheptyl Derivatives"; J. Med. Chem.; vol. 16(11); 1200-1206; 1973		
	Lozinskii, M.O., Bodnar, V.N., Konovalikhin, S.V., D'yachenko, O.A., Atovmyan, L.O.; "Unusual transformations of arylhydrazonoyl chlorides of oxalic acid ethyl ester"; Izvestiya Akademii Nauk SSSr, Seriya Khimicheskaya; 11; 2635-2637; 1990 (abstract only)		
	1 Ludt, R.E. et al; "A comparison of the synthetic utility of n-butyllithium and lithium diisopropylamide in the metalations of N,N-dialkyltouamides"; J. Org. Chem.; 38(9); 1668-1674 (1973)		
	*** Maccarron M., Endocannabinoids and their actions. Vitamins and Hormones 2002;65:225-255		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	Mackie K., Devane W.A., Hille B.; "Anandamide, an endogenous cannabinoid, inhibits calcium currents as a partial agonist in N18 neuroblastoma cells"; Mol. Pharmacol; 44; 498-0503 (1993)		
	1 *** <i>Markwell et al; Anal. Biochem.; 87:206 (1978)</i>		
	1 Martin et al; "Behavioral, biochemical, and molecular modeling evaluations of cannabinoid analogs"; Pharmacol. Biochem. Behav.; vol. 40(3); 471-478; 1991		
	1 Martyn CN. Illis LS, Thom J.; "Nabilone in the treatment of multiple sclerosis"; Lancet (1995) vol. 345; pp. 579.		
	1 Matsumoto et al; "Cannabinoids 1.1-amino-and 1 mercapto-7,8,9,10-tetrahydro-6h-dibenzo[b,d]pyrans"; J. of Med. Chem.; vol. 20(1); 17-24; 1977; XP00211825		
	1 *** <i>Maurer M, Henn V, Dittrich A, Hofmann A. Delta-9-tetrahydrocannabinol shows antispastic and analgesic effects in a single case double-blind trial. Eur. Arch. Psychiat. Clin. Neurosci. (1990), Z40:1-4.</i>		
	1 Mavromoustakos, T. et al; "Studies on the thermotropic effects of cannabinoids on phosphatidylcholine bilayers using differential scanning calorimetry and small angle X-ray diffraction"; Biochimica et Biophysica Acta; vol 1281(2); 1996; XP002111823		
	Mechoulam et al; "Stereochemical Requirements for cannabinoid activity"; J. Med. Chem.; 23(10); 1068-1072; (1980)		
	Mechoulam et al; "Synthesis of the individual, pharmacologically distinct, enantiomers of a tetrahydrocannabinol derivative"; Tetrahedron Asymmetry; 1: 311-314; (1990) (abstract only)		
	*** <i>Mechoulam et al; Tetrahedron Asymmetry; 1: 315-318; (1990)</i>		
	1 *** <i>Mechoulam, "Cannabinoids as therapeutic agents"; CRC press, 1986</i>		
	1 Meltzer et al; "An improved synthesis of cannabinol and cannabiorcol"; Synthesis; 1981:985 (1981)		
	*** <i>Melvin et al; drug design and discovery; 13; 155-166 (1995)</i>		
	Melvin et al; "Structure-activity relationships for cannabinoid receptor-binding and analgesic activity: studies of bicyclic cannabinoid analogs"; Mol. Pharmacol.; 44(5); 1008-1015 (1993)		
	1 Merck Index; 11th edition; "Tetrahydrocannabinols" compound no. 9142; 1989		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	1 *** <i>Morgan Dr: Therapeutic Uses of Cannabis. Harwood Academic Publishers, Amsterdam. (1997).</i>		
	1 *** <i>Morris, S.; Mechoulam, R.; and Irene, Y., Halogenation of phenols and Phenyl ethers with Potassium Halides in the Presence of 18-Crown-6 on Oxidation with m-Chloroperbenzoic Acid, J. Chem. Soc., Perkin Trans. 1 1987, 1423-1427</i>		
	1 *** <i>Muller-Vahl KB, Kolbe H, Schneider U, Emrich, HM Cannabis in movement disorders. Porsch. Kompicmentarmed (1999) 6 (suppl. 3) 23-27.</i>		
	1 *** <i>Muller-Vahl KB, Schneider U, Kolbe H, Emrich, HM. Treatment of Tourette's syndrome with delta-9-tetrahydrocannabinol. Am. J. Psychiat. (1999) 156-195.</i>		
	*** <i>Nahas G, Marijuana and Medicine; 1999, Human Press Inc., Totowa, NJ</i>		
	Neunhoeffer O., Gottschlich R.; "Acylation activity of O-acylated hydroxylamine derivatives"; Justus Liebigs Ann. Chem.; 736; 100-109; 1970; in German with English abstract		
	1 Novak, J et al; "Cannabis, part 27, synthesis of 8-, 10- and 11-oxygenated cannabinoids; J. Chem. Soc. Perkin Trans.; 2867-2871; (1983) (abstract only)		
	1 Nye et al; "High affinity cannabinoid binding sites in brain membranes labelled with [H]-5'-trimethylammonium delta8-tetrahydrocannabinol"; J. Pharmacol. Exp. Ther.; vol. 234(3); 784-791; 1985		
	*** <i>Palmer et al; current pharmaceutical design; 6; 1381-1397; (2000)</i>		
	1 Papahatjis et al; "A new ring-forming methodology for the synthesis of conformationally constrained bioactive molecules"; Chemistry Letters, 192; (2001)		
	1 Papahatjis et al; "Pharmacophoric requirements for cannabinoid side chains: multiple bond and C1'-substituted delta8-tetrahydrocannabinols"; J. Med. Chem.; 41(7); 1195-1200; (1998)		
	Pertwee et al; "AM630, a competitive cannabinoid receptor agonist"; Life Sci. 1995, 56(23/24), 1949-1955; XP 000653566		
	Pertwee et al; "Pharmacological characterization of three novel cannabinoid receptor agonists in the mouse isolated vas deferens"; Eur. J. Pharmacol. 1995, 284, 241-247; XP-001041044		
	*** <i>Pertwee et al; Br. J. Pharmacol.; 105; 980 1992</i>		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	1 Pertwee; Pharmacology of cannabinoid CB1 and CB2 receptors"; Pharmacol. Ther., vol. 74(2); pp129-180; (1997); XP002226467		
	Petrov, M.L., Terent'eva, N.A., Potekhin, K.A., Struchkov, Yu. T.; ".alpha.,.beta.-unsaturated thiolates and their analogs in cycloaddition reactions. XVIII. Reaction of (2-phenylethynyl)tellurolates with C-ethoxycarbonyl-N-Phenylnitrilimine"; Zhurnal Organicheskoi Khimii; 29(7); 1372-1378; (1993) (abstract only)		
	1 *** Pinnegan-Ling D, Musty R.; Marinol and phantom limb pain: a case study. Proc Inv. Cannabinoid Rea. Sec. (1994):53.		
	Piomelli D., Beltramo M., Glasnapp S., Lin S.Y., Goutopoulos A., Xiw X-Q., Makriyannis A.; "Structural determinants for recognition and translocation by the anandamide transporter"; Proc. Natl. Acad. Sci. USA; 96; 5802-5807; (1999)		
	1 Pitt et al; "The synthesis of Deuterium, carbon-14 and carrier free tritium labelled cannabinoids"; Journal of Labelled Compounds; vol. 11(4); 551-575; 1975; XP002123229		
	*** Porreca F., Mosberg H.I., Hurst R., Hruby V.J., Burks T.F.; "Roles of mu, delta and kappa opiod receptors in spinal and supraspinal mediation of gastrointestinal transit effects and hot-plate analgesia in the mouse"; J. Pharmacol. Exp. Ther.; 230; 341-348; (1994)		
	1 Razdan et al; "Drugs delivered from cannabinoids. 6. .Synthesis of cyclic analogues of dimethylheptylpyran"; J. Med. Chem.; vol. 19(5); 719-721; 1976 (abstract only)		
	1 Reggio et al; "Characterization of a region of steric interference at the cannabinoid receptor using the active analog approach"; J. Med. Chem. United States; vol. 36(12); 1761-1771; 1993		
	1 Rhee, M. H.; Vogel, Z.; Barg, J.; Bayewitch, M.; Levy, R.; Hanus, L.; Breuer, A.; and Mechoulam, R.; "Cannabinol Derivatives: Binding to Cannabinoid Receptors and Inhibition of Adenylcyclase"; J. Med. Chem. 1997, 40(20); 3228-3233		
	*** Rice AS. Cannabinoids and pain. Curr Opin Investig Drugs. 2001 Mar;2(3):399-414		
	1 Richardson JD, Aanonsen I, Hargreaves KM; "Antihyperalgesic effects of a spinal cannabinoids"; Eur. J. Pharmacol. (1998) 346:145-153.		
	1 Richardson JD, Kilo S. Hargreaves KM; "Cannabinoids reduce dryperalgesia and inflammation via interaction with peripheral CB1 receptors"; Pain (1998) 75:111-119.		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	Rinaldi-Carmona et al; "Biochemical and pharmacological characterization of SR141716A, the first potent and selective brain cannabinoid receptor antagonist"; Life Sci.; vol. 56(23/24); 1941-1947 (1995)		
	Rinaldi-Carmona et al; "SR141716A, a potent and selective antagonist of the brain cannabinoid receptor"; FEBS Lett.; 350; 240-244; (1994)		
	1 Rompp Chemie Lexikon; Falbe and Regitz; "band 1-A-C1, 8"; Aufl, Thieme Verlag; Stuttgart, S 569-570; 1989		
	Santus, Maria; "Studies on thioamides and their derivatives. IX. Synthesis of the derivatives of 1,2,4,5-tetrazine"; Acta Polonae Pharmaceutica; 50(2-3); 183-188; 1993 (abstract only)		
	Schatz AR et al; "Cannabinoid receptors CB1 and CB2: a characterization of expression and adenylate cyclase modulation within the immune system"; Toxicol Appl Pharmacol. 1997 Feb; 142(2):278-87		
	1 *** Schuel, H., Burkman, L.J., Picone, R.P., Bo, T., Makriyannis, A., Cannabinoid receptors in human sperm. Mol. Biol. Cell., (1997) (8), 325a.		
	*** Serdarevich B., Carroll K.K., "Synthesis and characterization of 1- and 2-monoglycerides of anteiso fatty acids"; J. Lipid Res.; 7; 277-284; (1966)		
	Shawali, A.S., Albar, H.A.; "Kinetics and mechanism of dehydrochlorination of N-aryl-C-ethoxycarbonyl formohydrazidoyl chlorides"; Canadian Journal Of Chemistry; 64(5); 871-875; 1986 (abstract only)		
	1 *** Shen M. Thayer SA: Cannabinoid receptor agonists protect cultured rat hippocampal neurons from excitotoxicity. Mol. Pharmacol (1996) 54:459-462.		
	Shim et al; "Three-dimensional quantitative structure-activity relationship study of the cannabimimetic (aminoalkyl)indoles using comparative molecular field analysis"; J. Med. Chem.; 1998, 41(23); 4521-4532; XP-002212407		
	Shim et al; "Unified pharmacophoric model for cannabinoids and aminoalkylindoles derived from molecular superimposition of CB1 cannabinoid receptor agonists CP55244 and WIN55212-2"; ACS Symposium series, 1999 719 (rational drug design), 165-184; XP-001095771		
	Showalter et al; "Evaluation of binding in a transfected cell line expressing a peripheral cannabinoid receptor (CB2): identification of cannabinoid receptor subtype selective ligands""; J. Pharmacol. Exp. Ther., 1996 278(3) 989-999; XP-001097918		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION	Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
	Title Keto Cannabinoids With Therapeutic Indications		
	Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004			
	1 *** <i>Simiand J, Keane M, Keane PE, Soubrie P: SR 141716, A CB1 cannabinoid receptor antagonist, selectively reduces sweet food intake in marmoset. Behav. Pharmacol (1998) 9:179-181.</i>		
	1 Smith P.B. et al; "The pharmacological activity of anandamide, a putative endogenous cannabinoid, in mice"; Journal of Pharmacology and Experimental Therapeutics; vol. 270(1):219-227; 1994		
	1 *** <i>Terranova J-P, Storme J-J Lafon N et al; "Improvement of memory in rodents by the selective CB1 cannabinoid receptor antagonist, SR 141716"; Psycho-pharmacol (1996) 126:165-172.</i>		
	Tius et al; "Conformationally restricted hybrids of CP-55,940 and HHC: Stereoselective synthesis and activity"; Tetrahedron; 50 (9); 2671-2680; (1994) (abstract only)		
	Twitchell, W. et al; "Cannabinoids inhibit N- and P/Q type calcium channels in cultured rat hippocampal neurons"; Journal of Neurophysiology; 78(1); 43-50; 1997 (abstract only)		
	*** <i>Ueda, N., Endocannabinoid hydrolases. Prostaglandins & Other Lipid Mediators 2002;68-69:521-534</i>		
	*** <i>Vogel Z., Barg J., Levy R., Saya D., Heldman E., Mechoulam R.; "Anandamide, a brain endogenous compound, interacts specifically with cannabinoid receptors and inhibits adenylate cyclase"; J. Neurochem.; 61(1) 352-355; (1993)</i>		
	1 *** <i>Wagner JA, Varga K, Jarai Z, Kunos G; 'Mesenteric vasodilation mediated by endothelial anandamide receptors'; Hypertension (1999) 33:429-434.</i>		
	1 <i>Watanabe, T.; Miyaura, N.; and Suzuki, A.; "Synthesis of Sterically Hindered Biaryls via the Palladium Catalyzed Cross-Coupling Reaction of Arylboronic Acids or their Esters with Haloarenes"; Synlett 1992, 207-210</i>		
	Wiley et al; "Structure activity relationships of indole and pyrrole derived cannabinoids"; J. Pharmacol. Exp. Ther. 1998, 285(3), 995-1004; XP-001097982		
	Wilson et al; "9-nor-delta8-tetrahydrocannabinol, a cannabinoid of metabolic interests"; J. Med. Chem.; 17(4); 475-476; (1974)		
	Wilson et al; "Analgesic properties of the tetrahydrocannabinols, their metabolites and analogs"; J. Med. Chem.; 18(7); 700-703; (1975)		
	Wilson et al; "9-nor-9-hydrohexahydrocannabinols. Synthesis, some behavioral and analgesic properties, and comparison with the tetrahydrocannabinols"; J. Med. Chem.; 19(9); 1165-1167; (1976)		

INFORMATION DISCLOSURE CITATION IN AN APPLICATION		Application No. 10/647,544	Inventor Alexandros Makriyannis et al	
		Title Keto Cannabinoids With Therapeutic Indications		
		Filing Date 08/25/2003	Group Art Unit 1625	Docket No. UCONAP/207/US
Mailed on: August 4, 2004				
	Yamada et al; "(Aminoalkyl)indole isothiocyanates as potential electrophilic affinity ligands for the brain cannabinoid receptor"; J. Med. Chem. 1996, vol. 39(10), 1967-1974			
	Yan, Guo et al; "Synthesis and pharmacological properties of 11-hydroxy-3-(1'-1'-dimethylheptyl)hexahydrocannabinol: a high affinity cannabinoid agonist"; J. Med. Chem.; vol. 37(16); 2619-2622; (1994)			
	1 Yan Guo et al; "(-)-11-hydroxy-7'-isothiocyanto-1'-1'-dimethylheptyl-delta8-THC: a novel probe for the cannabinoid receptor in the brain"; J. Med. Chem.; 37(23); 3867-3870; (1994)			
Examiner		Date Considered		
EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP §609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.				

G:\AYR saved docs\Filing Docs\Uconap\uconap207us regular of uconap.200.us\8-04 IDS.doc